

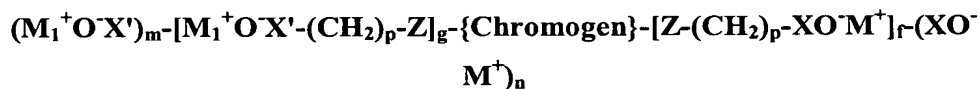
## IN THE CLAIMS

Please cancel claims 97, 135, and 164-172, without prejudice, and add the following claims:

173. (New) A polarizer, comprising a birefringent and anisotropically absorbing layer having a first refractive index that increases as the polarizable light wavelength increases and that is directly proportional to the polarizable light wavelength, at least for a certain range of wavelengths, wherein the at least one birefringent and anisotropically absorbing layer has a thickness such that an output of the polarizer coincides with an interference extremum of a linearly-polarized light component, and wherein the at least one birefringent and anisotropically absorbing layer is formed of:

at least one organic salt of a dichroic anionic dye having the general formula: {Chromogen}-(XO<sup>-</sup>M<sup>+</sup>)<sub>n</sub>; wherein {Chromogen} is a dye chromophore system; wherein each X = CO, SO<sub>2</sub>, OSO<sub>2</sub>, or OPO(O<sup>-</sup>M<sup>+</sup>); and wherein each M is independently RR'NH<sub>2</sub>, RR'R''NH, RR'R''R<sup>^</sup>N, or RR'R''R<sup>^</sup>P; wherein each of R, R', R'', and R<sup>^</sup> is independently CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, C<sub>4</sub>H<sub>9</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>m</sub>-CH<sub>2</sub>CH<sub>2</sub> such that Y = O or NH and such that m = 0-5, N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, or N-alkylthiazolinium; and wherein n = 1-7;

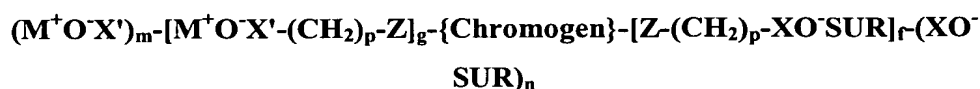
at least one asymmetric mixed salt of a dichroic anionic dye with different cations having the general formula:



wherein {Chromogen} is a dye chromophore system; wherein each Z is independently SO<sub>2</sub>NH, SO<sub>2</sub>, CONH, CO, O, S, NH, or CH<sub>2</sub>; wherein each p is independently from 1-10; wherein each of f, g, n, and m are independently 0-9, wherein each of (n+f) and (m+g) are independently 1-10; wherein each of X and X' are independently CO, SO<sub>2</sub>, OSO<sub>2</sub>, or PO(O<sup>-</sup>M<sup>+</sup>); wherein M ≠ M<sub>1</sub>, and wherein each M and M<sub>1</sub> are independently H, an inorganic cation selected from the group consisting of NH<sub>4</sub>, Li, Na, K, Cs, Mg, Ca, Ba, Fe, Ni, and Co, an organic cation selected from the group consisting of RNH<sub>3</sub>, RR'NH<sub>2</sub>, RR'R''NH, RR'R''R<sup>\*</sup>N, and RR'R''R<sup>\*</sup>P, such that each

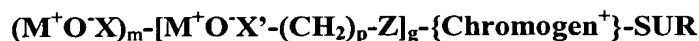
of R, R', R'', R\* are independently alkyl or substituted alkyl groups selected from the group consisting of CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, HOC<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, and C<sub>4</sub>H<sub>9</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>k</sub>-CH<sub>2</sub>CH<sub>2</sub> such that each Y is independently O or NH and such that k = 0-10, or a heteroaromatic cation selected from the group consisting of N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, and N-alkythiazolinium;

at least one associate of a dichroic anionic dye with a surface-active cation and/or an amphoteric surfactant having the general formula:



wherein {Chromogen} is a dye chromophore system; wherein each Z is independently SO<sub>2</sub>NH, SO<sub>2</sub>, CONH, CO, O, S, NH, or CH<sub>2</sub>; wherein each p is independently from 1-10; wherein each of f and n are independently 0-4; wherein each of g and m are independently 0-9; wherein (n+f) = 1-4; wherein (m+g) = 0-9; wherein each X and X' are independently CO, SO<sub>2</sub>, OSO<sub>2</sub>, or PO(O<sup>-</sup>M<sup>+</sup>); wherein each M is independently H, an inorganic cation selected from the group consisting of NH<sub>4</sub>, Li, Na, K, Cs, Mg, Ca, Ba, Fe, Ni, and Co, an organic cation selected from the group consisting of RNH<sub>3</sub>, RR'NH<sub>2</sub>, RR'R''NH, RR'R''R\*N, and RR'R''R\*P, where each of R, R', R'', R\* are independently an alkyl or substituted alkyl group selected from the group consisting of CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, HOC<sub>2</sub>H<sub>4</sub>, and C<sub>2</sub>H<sub>5</sub>, C<sub>10</sub>H<sub>21</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>k</sub>-CH<sub>2</sub>CH<sub>2</sub> such that each Y is independently O or NH and such that k = 0-10, a heteroaromatic cation selected from the group consisting of N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, N-alkylthiazolinium, and K'SUR<sup>+</sup>; wherein each SUR is independently KSUR<sup>+</sup>, K'SUR<sup>+</sup>, or AmSUR; wherein KSUR<sup>+</sup> and K'SUR<sup>+</sup> are surface-active cations; and wherein AmSUR is an amphoteric surfactant;

at least one associate of a dichroic cationic dye with a surface-active anion and/or an amphoteric surface-active dye having the general formula:



wherein {Chromogen<sup>+</sup>} is a dye chromophore system; wherein each Z is independently SO<sub>2</sub>NH, SO<sub>2</sub>, CONH, CO, O, S, NH, or CH<sub>2</sub>; wherein each p is

independently from 1-10; wherein each of g and m are independently 0-1, such that  $m+g=1$ ; wherein each of X and X' are independently CO, SO<sub>2</sub>, OSO<sub>2</sub>, or PO(O<sup>-</sup>M<sup>+</sup>); wherein each M is independently H, an inorganic cation selected from the group consisting of NH<sub>4</sub>, Li, Na, K, Cs, Mg, Ca, Ba, Fe, Ni, and Co, an organic cation selected from the group consisting of RNH<sub>3</sub>, RR'NH<sub>2</sub>, RR'R''NH, RR'R''R\*N, and RR'R''R\*P; wherein each of R, R', R'', and R\* are independently an alkyl or substituted alkyl group selected from the group consisting of CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, HOC<sub>2</sub>H<sub>4</sub>, and C<sub>2</sub>H<sub>5</sub>-C<sub>10</sub>H<sub>21</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>k</sub>-CH<sub>2</sub>CH<sub>2</sub> such that each Y is independently O or NH and such that k = 0-10, a heteroaromatic cation selected from the group consisting of N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, N-alkylthiazolinium and KSUR<sup>+</sup>; wherein KSUR<sup>+</sup> is a surface-active cation; wherein SUR = ASUR or AmSUR; wherein ASUR<sup>-</sup> is surface active cation; and wherein AmSUR is an amphoteric surfactant;

at least of one associate of a dichroic cationic dye with a surface-active cation and/or an amphoteric surfactant having the general formula:



wherein {Chromogen} is a dye chromophore system; wherein each Z is independently SO<sub>2</sub>NH, SO<sub>2</sub>, CONH, CO, O, S, NH, or CH<sub>2</sub>; wherein each p is independently from 1-10; wherein each X is independently N or P; wherein each of R, R', and R'' are independently an alkyl or substituted alkyl group selected from the group consisting of CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, HOC<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>5</sub>, and C<sub>3</sub>H<sub>7</sub>; wherein each SUR is independently ASUR<sup>-</sup> or AmSUR; wherein ASUR<sup>-</sup> is a surface-active anion; wherein AmSUR is an amphoteric surfactant; and wherein n = 1-4;

at least one water-insoluble dichroic dye and/or pigment that do(es) not contain ionogenic or hydrophilic groups;

at least one low-molecular weight thermotropic liquid-crystal substance being a dichroic dye or containing, as a component, a liquid-crystal and/or a dichroic dye other than a liquid-crystal dye, wherein the at least one low-molecular weight thermotropic liquid-crystal substance is vitrified;

at least one polymer material other than liquid-crystal polymer material, having a controlled degree of hydrophilicity and having been dyed with a dichroic dye and/or an iodine compound;

at least one polymer thermotropic liquid-crystal and/or non-liquid-crystal substance comprising solved in mass and/or chemically bonded with a polymer chain dichroic dyes;  
at least one dichroic dye capable of forming a lyotropic liquid-crystal phase;  
at least one polymeric dichroic dye;  
at least one water-soluble organic dye capable of forming a stable lyotropic liquid-crystal phase having the general formula: {Chromogen}-(SO<sub>3</sub>M)<sub>n</sub>, wherein {Chromogen} is a dye chromophore system; wherein each M is independently H or an inorganic cation; and wherein n = 1 to 7; or  
a mixture thereof.

174. (New) The polarizer according to claim 173, wherein the first refractive index of the at least one birefringent and anisotropically absorbing layer has a maximal value of at least 1.9.

175. (New) The polarizer according to claim 173, wherein the thickness of the birefringent and anisotropically absorbing layer is such that the output of the polarizer coincides with an interference minimum for a first linearly-polarized light component and with an interference maximum for a second linearly-polarized light component that is orthogonal to the first linearly-polarized light component.

176. (New) The polarizer according to claim 173 or 175, further comprising an optically isotropic layer whose refractive index coincides with, or is maximally proximate to, a refractive index of the birefringent and anisotropically absorbing layer.

177. (New) The polarizer according to claim 173 or 175, further comprising a second birefringent layer having a second refractive index that coincides with, or is maximally proximate to, the first refractive index of the birefringent and anisotropically absorbing layer, wherein the second refractive index of the birefringent layer is different from the first refractive index of the birefringent and anisotropically absorbing layer.

178. (New) A liquid crystal display element comprising:  
first and second plates;

a liquid crystal material between the first and second plates; and  
at least one polarizer according to any one of claims 173-177 disposed  
at least on one of said first and second plates.

179. (New) The polarizer according to claim 173, wherein the polarizer  
is of the interference type.

180. (New) The polarizer according to claim 173, wherein the polarizer  
is of the dichroic type.

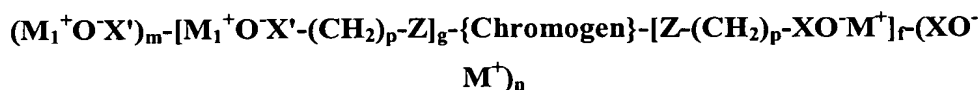
181. (New) The polarizer according to claim 173, wherein the polarizer  
is of the transmissive type.

182. (New) The polarizer according to claim 173, wherein the polarizer  
is of the reflecting type.

183. (New) A polarizer, comprising a birefringent and anisotropically  
absorbing layer having a first refractive index that increases as the polarizable light  
wavelength increases, at least for a certain range of wavelengths, wherein the first  
refractive index of the at least one birefringent and anisotropically absorbing layer has  
a maximal value of at least 1.9, wherein the at least one birefringent and  
anisotropically absorbing layer has a thickness such that an output of the polarizer  
coincides with an interference extremum of a linearly-polarized light component, and  
wherein the at least one birefringent and anisotropically absorbing layer is formed of:

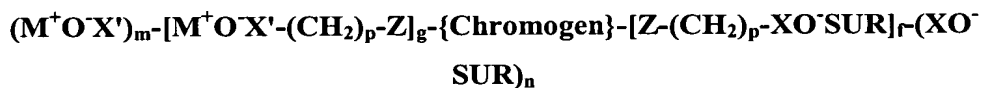
at least one organic salt of a dichroic anionic dye having the general  
formula: **{Chromogen}-(XO<sup>-</sup>M<sup>+</sup>)<sub>n</sub>**; wherein {Chromogen} is a dye chromophore  
system; wherein each X = CO, SO<sub>2</sub>, OSO<sub>2</sub>, or OPO(O<sup>-</sup>M<sup>+</sup>); and wherein each M is  
independently RR'NH<sub>2</sub>, RR'R''NH, RR'R''R<sup>N</sup>, or RR'R''<sup>P</sup>; wherein each of R, R',  
R'', and R<sup>N</sup> is independently CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, C<sub>4</sub>H<sub>9</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted  
phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>m</sub>-CH<sub>2</sub>CH<sub>2</sub> such that Y = O or NH and  
such that m = 0-5, N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, or  
N-alkylthiazolinium; and wherein n = 1-7;

at least one asymmetric mixed salt of a dichroic anionic dye with  
different cations having the general formula:



wherein {Chromogen} is a dye chromophore system; wherein each Z is independently SO<sub>2</sub>NH, SO<sub>2</sub>, CONH, CO, O, S, NH, or CH<sub>2</sub>; wherein each p is independently from 1-10; wherein each of f, g, n, and m are independently 0-9, wherein each of (n+f) and (m+g) are independently 1-10; wherein each of X and X' are independently CO, SO<sub>2</sub>, OSO<sub>2</sub>, or PO(O<sup>-</sup>M<sup>+</sup>); wherein M ≠ M<sub>1</sub>, and wherein each M and M<sub>1</sub> are independently H, an inorganic cation selected from the group consisting of NH<sub>4</sub>, Li, Na, K, Cs, Mg, Ca, Ba, Fe, Ni, and Co, an organic cation selected from the group consisting of RNH<sub>3</sub>, RR'NH<sub>2</sub>, RR'R''NH, RR'R''R\*N, and RR'R''R\*P, such that each of R, R', R'', R\* are independently alkyl or substituted alkyl groups selected from the group consisting of CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, HOC<sub>2</sub>H<sub>4</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, and C<sub>4</sub>H<sub>9</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>k</sub>-CH<sub>2</sub>CH<sub>2</sub> such that each Y is independently O or NH and such that k = 0-10, or a heteroaromatic cation selected from the group consisting of N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, and N-alkythiazolinium;

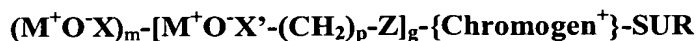
at least one associate of a dichroic anionic dye with a surface-active cation and/or an amphoteric surfactant having the general formula:



wherein {Chromogen} is a dye chromophore system; wherein each Z is independently SO<sub>2</sub>NH, SO<sub>2</sub>, CONH, CO, O, S, NH, or CH<sub>2</sub>; wherein each p is independently from 1-10; wherein each of f and n are independently 0-4; wherein each of g and m are independently 0-9; wherein (n+f) = 1-4; wherein (m+g) = 0-9; wherein each X and X' are independently CO, SO<sub>2</sub>, OSO<sub>2</sub>, or PO(O<sup>-</sup>M<sup>+</sup>); wherein each M is independently H, an inorganic cation selected from the group consisting of NH<sub>4</sub>, Li, Na, K, Cs, Mg, Ca, Ba, Fe, Ni, and Co, an organic cation selected from the group consisting of RNH<sub>3</sub>, RR'NH<sub>2</sub>, RR'R''NH, RR'R''R\*N, and RR'R''R\*P, where each of R, R', R'', R\* are independently an alkyl or substituted alkyl group selected from the group consisting of CH<sub>3</sub>, ClC<sub>2</sub>H<sub>4</sub>, HOC<sub>2</sub>H<sub>4</sub>, and C<sub>2</sub>H<sub>5</sub>-C<sub>10</sub>H<sub>21</sub>, C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>, a substituted phenyl or heteroaryl group, YH-(CH<sub>2</sub>-CH<sub>2</sub>-Y)<sub>k</sub>-CH<sub>2</sub>CH<sub>2</sub> such that each Y is independently O or NH and such that k = 0-10, a heteroaromatic cation selected from the group consisting

of N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, N-alkylthiazolinium, and  $K'SUR^+$ ; wherein each SUR is independently  $KSUR^+$ ,  $K'SUR^+$ , or AmSUR; wherein  $KSUR^+$  and  $K'SUR^+$  are surface-active cations; and wherein AmSUR is an amphoteric surfactant;

at least one associate of a dichroic cationic dye with a surface-active anion and/or an amphoteric surface-active dye having the general formula:



wherein  $\{Chromogen^+\}$  is a dye chromophore system; wherein each Z is independently  $SO_2NH$ ,  $SO_2$ ,  $CONH$ ,  $CO$ ,  $O$ ,  $S$ ,  $NH$ , or  $CH_2$ ; wherein each p is independently from 1-10; wherein each of g and m are independently 0-1, such that  $m+g=1$ ; wherein each of X and X' are independently  $CO$ ,  $SO_2$ ,  $OSO_2$ , or  $PO(O^-M^+)$ ; wherein each M is independently H, an inorganic cation selected from the group consisting of  $NH_4$ , Li, Na, K, Cs, Mg, Ca, Ba, Fe, Ni, and Co, an organic cation selected from the group consisting of  $RNH_3$ ,  $RR'NH_2$ ,  $RR'R''NH$ ,  $RR'R''R^*N$ , and  $RR'R''R^*P$ ; wherein each of R, R', R'', and R\* are independently an alkyl or substituted alkyl group selected from the group consisting of  $CH_3$ ,  $ClC_2H_4$ ,  $HOC_2H_4$ , and  $C_2H_5$ - $C_{10}H_{21}$ ,  $C_6H_5CH_2$ , a substituted phenyl or heteroaryl group,  $YH-(CH_2-CH_2-Y)_k-CH_2CH_2$  such that each Y is independently O or NH and such that  $k = 0-10$ , a heteroaromatic cation selected from the group consisting of N-alkylpyridinium, N-alkylchinolinium, N-alkylimidazolinium, N-alkylthiazolinium and  $KSUR^+$ ; wherein  $KSUR^+$  is a surface-active cation; wherein SUR = ASUR or AmSUR; wherein ASUR is surface active cation; and wherein AmSUR is an amphoteric surfactant;

at least of one associate of a dichroic cationic dye with a surface-active cation and/or an amphoteric surfactant having the general formula:



wherein  $\{Chromogen\}$  is a dye chromophore system; wherein each Z is independently  $SO_2NH$ ,  $SO_2$ ,  $CONH$ ,  $CO$ ,  $O$ ,  $S$ ,  $NH$ , or  $CH_2$ ; wherein each p is independently from 1-10; wherein each X is independently N or P; wherein each of R, R', and R'' are independently an alkyl or substituted alkyl group selected from the group consisting of  $CH_3$ ,  $ClC_2H_4$ ,  $HOC_2H_4$ ,  $C_2H_5$ , and  $C_3H_7$ ; wherein each SUR is independently ASUR or AmSUR; wherein ASUR is a surface-active anion; wherein AmSUR is an

amphoteric surfactant; and wherein  $n = 1-4$ ;

at least one water-insoluble dichroic dye and/or pigment that do(es) not contain ionogenic or hydrophilic groups;

at least one low-molecular weight thermotropic liquid-crystal substance being a dichroic dye or containing, as a component, a liquid-crystal and/or a dichroic dye other than a liquid-crystal dye, wherein the at least one low-molecular weight thermotropic liquid-crystal substance is vitrified;

at least one polymer material other than liquid-crystal polymer material, having a controlled degree of hydrophilicity and having been dyed with a dichroic dye and/or an iodine compound;

at least one polymer thermotropic liquid-crystal and/or non-liquid-crystal substance comprising solved in mass and/or chemically bonded with a polymer chain dichroic dyes;

at least one dichroic dye capable of forming a lyotropic liquid-crystal phase;

at least one polymeric dichroic dye;

at least one water-soluble organic dye capable of forming a stable lyotropic liquid-crystal phase having the general formula:  $\{\text{Chromogen}\}-(\text{SO}_3\text{M})_n$ , wherein {Chromogen} is a dye chromophore system; wherein each M is independently H or an inorganic cation; and wherein  $n = 1$  to  $7$ ; or  
a mixture thereof.

184. (New) The polarizer according to claim 183, wherein the first refractive index is directly proportional to the polarized light wavelength, at least for the certain range of wavelengths.

185. (New) The polarizer according to claim 183, wherein the thickness of the birefringent and anisotropically absorbing layer is such that the output of the polarizer coincides with an interference minimum for a first linearly-polarized light component and with an interference maximum for a second linearly-polarized light component that is orthogonal to the first linearly-polarized light component.

186. (New) The polarizer according to claim 183 or 185, further comprising an optically isotropic layer whose refractive index coincides with, or is



maximally proximate to, a refractive index of the birefringent and anisotropically absorbing layer.

187. (New) The polarizer according to claim 183 or 185, further comprising a second birefringent layer having a second refractive index that coincides with, or is maximally proximate to, the first refractive index of the birefringent and anisotropically absorbing layer, wherein the second refractive index of the birefringent layer is different from the first refractive index of the birefringent and anisotropically absorbing layer.

188. (New) A liquid crystal display element comprising:  
first and second plates;  
a liquid crystal material between the first and second plates; and  
at least one polarizer according to any one of claims 183-187 disposed at least on one of said first and second plates.

189. (New) The polarizer according to claim 183, wherein the polarizer is of the interference type.

190. (New) The polarizer according to claim 183, wherein the polarizer is of the dichroic type.

191. (New) The polarizer according to claim 183, wherein the polarizer is of the transmissive type.

192. (New) The polarizer according to claim 183, wherein the polarizer is of the reflecting type.